

OIL ANALYSIS REPORT

Area MACHINE SHOP 0-5938-0000

Diesel Engine Fluid DIESEL ENGINE OIL SAE 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Check for low coolant level. We advise that you check for the source of the coolant leak. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.



SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0867033	WC0922578	WC0867039
Sample Date		Client Info		13 May 2024	29 Apr 2024	28 Jan 2024
Machine Age	hrs	Client Info		17771	17771	8937
Oil Age	hrs	Client Info		1634	9007	8937
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				ATTENTION	NORMAL	ABNORMAL
CONTAMINATIO	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METALS	-	method	limit/base	current	history1	history2
Iron	maa	ASTM D5185m	>100	55	10	66
Chromium	ppm	ASTM D5185m	>20	2	2	<u> </u>
Nickel	ppm	ASTM D5185m	>4	<1	<1	1
Titanium	ppm	ASTM D5185m		1	<1	2
Silver	ppm	ASTM D5185m	>3	<1	0	<1
Aluminum	ppm	ASTM D5185m	>20	4	3	5
Lead	mag	ASTM D5185m	>40	6	<1	3
Copper	nnm	ASTM D5185m	>330	6	4	42
Tin	nnm	ASTM D5185m	>15	1	-1	1
Vanadium	nnm	ASTM D5185m	210	-1	<1	<1
Cadmium	nnm	ASTM D5185m		<1	<1	<1
ouumum	PPIII					~ .
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current	history1 0	history2 3
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 250 10	current <1 <1	history1 0 0	history2 3 5
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100	current <1 <1 100	history1 0 0 87	history2 3 5 100
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100	current <1 <1 100 <1	history1 0 0 87 <1	history2 3 5 100 1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450	current <1 <1 100 <1 42	history1 0 0 87 <1 14	history2 3 5 100 1 19
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000	current <1 <1 100 <1 42 3541	history1 0 87 <1 14 3126	history2 3 5 100 1 19 4743
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150	<pre>current <1 <1 100 <1 42 3541 1160</pre>	history1 0 87 <1 14 3126 1132	history2 3 5 100 1 19 4743 1486
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350	<pre>current <1 <1 100 <1 42 3541 1160 1460</pre>	history1 0 87 <1 14 3126 1132 1259	history2 3 5 100 1 19 4743 1486 1864
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250	<1 <1 100 <1 3541 1160 1460 17059	history1 0 0 87 <1 14 3126 1132 1259 17636	history2 3 5 100 1 19 4743 1486 1864 25466
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 Limit/base	current <1 <1 100 <1 42 3541 1160 1460 17059 current	history1 0 0 87 <1 14 3126 1132 1259 17636 history1	history2 3 5 100 1 19 4743 1486 1864 25466 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25	<1 <1 100 <1 42 3541 1160 1460 17059 current 12	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	methodASTM D5185mASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	<1 <1 100 <1 42 3541 1160 1460 17059 current 12 102	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 kimit/base >25 >158 >20	current <1 <1 100 <1 42 3541 1160 1460 17059 current 12 12 102 10	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 25 >25 >158 >20	current <1 <1 100 <1 42 3541 1160 1460 17059 current 12 10 102 10 NEG	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 NEG
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D2982 method	limit/base 250 10 100 450 3000 1150 1350 4250 25 >25 >158 >20 Limit/base	current <1 <1 100 <1 42 3541 1160 1460 17059 current 12 10 102 10 NEG	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 4 NEG history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m *ASTM D2982 method *ASTM D7844	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3	current <1 <1 100 <1 42 3541 1160 1460 17059 current 12 10 NEG current 0.5	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1 0.4	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 4 NEG history2 2.2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20	<1 <1 100 <1 42 3541 1160 1460 17059 current 12 102 10 NEG 0.5 10.7	history1 0 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1 0.4 5.5	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 NEG history2 2.2 11.7
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m *ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20 >30	<1 <1 100 <1 42 3541 1160 1460 17059 current 12 102 10 NEG 0.5 10.7 31.0	history1 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1 0.4 5.5 25.2	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 NEG history2 2.2 11.7 35.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 >20 >30	<1 <1 100 <1 42 3541 1160 1460 17059 current 12 102 10 NEG 0.5 10.7 31.0	history1 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1 0.4 5.5 25.2 history1	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 NEG history2 2.2 11.7 35.1 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7844 *ASTM D7415 method *ASTM D7414	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >20 limit/base >3 >20 >30 limit/base >3 >20	<1 <1 100 <1 42 3541 1160 1460 17059 current 12 102 10 NEG current 0.5 10.7 31.0 current	history1 0 87 <1 14 3126 1132 1259 17636 history1 4 2 3 NEG history1 0.4 5.5 25.2 history1 15.9	history2 3 5 100 1 19 4743 1486 1864 25466 history2 10 4 NEG history2 2.2 11.7 35.1 history2 20.5



OIL ANALYSIS REPORT









VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	historv1	historv2
Visc @ 100°C	cSt	ASTM D445	14.4	14.0	13.6	14.3

GRAPHS







Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 **ALLVAC - MACHINE SHOP** Sample No. : WC0867033 Received : 16 May 2024 2020 ASHCRAFT AVE Lab Number : 06181531 Tested : 20 May 2024 MONROE, NC Unique Number : 11032857 Diagnosed : 20 May 2024 - Sean Felton US 28110 Test Package : IND 2 (Additional Tests: Glycol) Contact: mark eilerman Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. mark.eilerman@atimaterials.com T: (704)292-4051 * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: ALLMONMACH [WUSCAR] 06181531 (Generated: 05/20/2024 10:39:18) Rev: 1

F: (704)282-0665 Submitted By: ?